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The Influence of Virtual Reality on Marketing Education in Jordan: A Developing Synthesis

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ABSTRACT

This research aims at examining the splendid affordance of virtual reality (VR) in enhancing marketing education in Jordan. The research focusses on the effects of integrating the use of marketing simulations through virtual reality on students' perceptions of course interestingness, desire to learn, confidence in course contents, and recall ability. What is more, it explores how cultural background and technological skill impact the results of virtual reality. This well-thought-out mixed-methods research incorporates a well-designed quantitative questionnaire with carefully designed semi-structured interviews to gather quantitative and qualitative data in a small, selected sample of Jordanian university students studying in prestigious programs in the field of marketing. It is a clear implication of the study that VR goes a long way in enhancing students' interest, enthusiasm, and confidence in their capabilities, as well as mastery and knowledge, all crucial attributes towards the development of essential marketing skills. However, due to cultural background and technological literacy, the effectiveness of VR differs, and that is why applications should be culturally sensitive, and people who use VR should receive detailed instructions and support. The findings of the study include a more accurate verification of the contribution of VR within the domain of marketing while stressing the importance of enabling cultural sensitivity and technological skills in the application of VR projects.

Keywords: virtual reality (VR), marketing education, higher education, Jordan, learning outcomes, engagement, motivation, self-efficacy, knowledge retention.

INTRODUCTION

The use of technology in teaching and learning is changing the learning paradigm, especially with the use of VR as a tool to enhance learners' engagement and understanding. Studies carried out recently, as highlighted by Aguirre-Calan et al. (2024), suggest that virtual reality may improve empathy and learning among university students, suggesting its usability in almost all fields of study (Kilani & Hammouri, 2024). Loureiro et al. (2020) have discussed the role of virtual reality and gamification in advertising and marketing of the places of higher learning and proposed a research agenda to examine the possible impact on the acquisition of skills and learning motivation of the learners. This remains evident in the recent development of open-source VR applications, for instance, MyScore by Chandra et al. (2023), to show the interest in the use of VR in the delivery of interactive and immersive learning activities in marketing education. However, although there has been this progress evident, there is still a research gap regarding the exact impact of VR on marketing education within Jordanian context (Mansour et al., 2024). This study aims at filling this gap by looking at the possibilities of enhancing education and equipping the Jordanian students with the right tools for a successful future in the dynamic marketing environment through the use of virtual reality technologies (Mohammed et al., 2021). Moreover, this research provides an opportunity to

reveal and understand how virtual reality a unique tool for can be educating the younger generation of marketers in Jordan and thus help enhance an array of captivating, impactful, and culturally sensitive innovative learning experiences.

CONCEPTUAL FRAMEWORK

This research aims at investigating how VR holds the potential of enhancing marketing education in Jordan while bearing in mind the gaps identified in the previous literature. The conceptual framework is based on the premise that VR, which enables the creation of engaging and interactive learning experiences, has the potential to significantly enhance students' interest, motivation, and competence, as well as their long-term learning in marketing education (Nusairat et al., 2020a). Essential Principles: Virtual Reality (VR): This technology is great as it produces very interesting and appealing experiences that can be customised to suit the learning objectives in the most detailed way. This paper aims at assessing the effectiveness of the use of VR simulations in the marketing education process to improve the marketing skills, expand the understanding of the concepts, and encourage the critical thinking of the students (Nusairat et al., 2020b). Marketing Education: This research focusses on the effective use of VR in marketing education with the aim of identifying its potential to enhance the comprehension of marketing concepts and practices. Cultural Context: The social and economic features of the cultural landscape of Jordan form an important part of this research. The following will seek to establish how cultural values and norms will affect student participation in the use of virtual reality and the subsequent impact on the students' performance (Hammouri & Abu-Shanab, 2017a).

Engagement is widely recognized as a critical factor influencing the effectiveness of the learning process, as it reflects the degree of students' attention, interest, participation, and emotional involvement in educational activities. In recent years, Virtual Reality (VR) has emerged as an innovative educational technology capable of transforming passive learning experiences into highly interactive and immersive environments. Unlike traditional teaching methods that often rely on static content and one-way information delivery, VR enables learners to actively interact with virtual environments, explore realistic scenarios, and engage with learning materials in a more meaningful manner (Rabaai et al., 2022). The immersive nature of VR allows students to experience marketing concepts in simulated real-world settings, making abstract theories more tangible and easier to understand. By creating a sense of presence and realism (Nusairat et al., 2021), VR encourages learners to become active participants rather than passive recipients of information. This increased level of interaction has been associated with higher cognitive, emotional, and behavioral engagement, as students tend to devote greater attention and effort to learning tasks when they perceive them as interesting and relevant (Kaur et al., 2022). Furthermore, VR environments often incorporate elements of exploration, experimentation, and immediate feedback, which can sustain learners' motivation and promote deeper involvement in the learning process (Abu-Shanabet al., 2016).

Previous studies have consistently highlighted the positive impact of VR on student engagement across different educational settings. For example, Marougkas et al. (2023) found that immersive VR experiences enhance learners' willingness to participate and interact with educational content. Similarly, Lampropoulos and Kinshuk (2024) argued that VR technologies create stimulating learning environments that capture students' attention and foster sustained engagement throughout the learning experience. In the context of marketing education, VR simulations can recreate realistic consumer behavior scenarios, retail environments, and marketing decision-making situations, allowing students to actively apply theoretical concepts and observe their practical implications (Abu-Shanab et al., 2019). Such experiential learning opportunities are often difficult to achieve through conventional classroom instruction alone (Ahmad et al., 2024). Moreover, VR-based learning aligns with experiential learning theory, which emphasizes learning through direct experience and active participation. By enabling students to visualize marketing phenomena, interact with virtual consumers, and engage in realistic business situations, VR can increase both intrinsic motivation and learning engagement. Hammouri et al. (2023) further suggested that immersive simulations encourage students to remain focused on learning tasks for longer periods, thereby improving concentration and reducing distractions commonly associated with traditional instructional methods (Akhorshaideh et al., 2024). As students become more immersed in the learning environment, they are more likely to invest cognitive and emotional resources in educational experience, leading to higher levels of engagement. Given the ability of VR to provide interactive, realistic, and learner-centered experiences, it is reasonable to expect that students exposed to marketing content through VR will demonstrate higher levels of engagement compared to those learning through traditional instructional approaches (Ghaith et al., 2023; Hammouri et al., 2020; Raed et al., 2023a). Therefore, the following hypothesis is proposed:

H1: Marketing content through VR will lead to significantly higher levels of engagement.

Motivation and self-efficacy are among the most important psychological factors influencing students' learning outcomes and academic success (Hamad et al., 2025). Motivation reflects the willingness and enthusiasm of students to engage in learning activities, while self-efficacy refers to their belief in their ability to successfully perform learning tasks and achieve desired outcomes (Zubeidat et al., 2025). According to social cognitive theory, individuals with higher levels of self-efficacy are more likely to demonstrate persistence, exert greater effort, and maintain positive attitudes toward challenging learning activities (Awad, 2025). Consequently, educational approaches that enhance students' motivation and confidence can significantly improve learning effectiveness and academic performance (Dallasheh et al., 2024). Virtual Reality (VR) has gained considerable attention as a learning technology capable of fostering both motivation and self-efficacy through immersive and interactive experiences (Majadly et al., 2024; Awad, 2016; Raed et al., 2023b). Unlike traditional instructional methods that often emphasize passive knowledge acquisition, VR allows students to actively participate in realistic simulations where they can apply theoretical concepts in practical contexts (Awad, 2023). In marketing education, VR can expose students to virtual marketplaces, customer interactions, branding activities, and business decision-making scenarios that closely resemble real-world situations (Awad et al., 2022). Such experiences provide learners with opportunities to practice skills, experiment with different strategies, and observe the consequences of their decisions in a safe and controlled environment (Chung et al., 2021). Previous studies have highlighted the positive influence of VR on learners' motivation and perceived competence. Ahmad et al. (2022) found that immersive learning environments increase students' interest in educational activities by making learning experiences more enjoyable, interactive, and meaningful. Similarly, Yassine et al. (2022) reported that VR-based learning encourages students to participate more actively in the learning process, resulting in higher levels of motivation and academic engagement (Hammouri et al., 2021). The realistic nature of VR simulations enables students to connect theoretical knowledge with practical applications, thereby enhancing the perceived value and relevance of learning activities (Akhorshaideh et al., 2023). Furthermore, VR has been shown to strengthen self-efficacy by providing repeated opportunities for practice and skill development without the risks typically associated with real-world environments. According to Nusairat et al. (2020), learners who engage in simulated experiences are able to develop confidence in their abilities as they gradually master tasks and receive immediate feedback on their performance. Likewise, Smutny (2022) argued that VR environments support experiential learning by allowing students to learn through exploration, trial and error, and direct interaction with learning content. This process helps learners develop a stronger sense of competence and control over their learning outcomes. Vats and Joshi (2024) further suggested that the immersive and interactive features of VR contribute to increased self-confidence by reducing anxiety and encouraging active participation in learning activities (al Freijat et al., 2022).

In the context of marketing education, VR simulations can provide students with opportunities to practice marketing-related skills, such as consumer analysis, product positioning, promotional planning, and customer engagement, within realistic virtual settings (Hammouri et al., 2023). Successfully completing these activities can enhance students' confidence in their ability to understand and apply marketing concepts (Mansour & Heba, 2021). At the same time, the engaging and experiential nature of VR can stimulate intrinsic motivation by making learning more enjoyable and personally rewarding. As students become more confident in their capabilities and more motivated to learn, they are likely to demonstrate greater commitment to the learning process and achieve better educational outcomes (Al Freijat et al., 2024). Given the ability of VR to create immersive, interactive, and realistic learning experiences, it is expected that its use in marketing education will positively influence both students' motivation and self-efficacy (Abd Algani et al., 2021). Therefore, the following hypothesis is proposed:

H2: Marketing concepts learned through virtual reality will significantly increase students' motivation and self-efficacy.

Students' cultural backgrounds can influence how they perceive, interpret, and engage with VR-based learning experiences (Al Khasabah et al., 2025). Cultural values, beliefs, and social norms shape learners' attitudes toward educational technologies and may affect their willingness to participate in immersive learning environments (Al Shibly et al., 2025). Previous studies have suggested that cultural differences can influence students' acceptance of digital technologies, learning preferences, and interactions with virtual content (Banks, 2015; Hammouri et al., 2022; Al-Dwairi et al., 2024). Furthermore, Alqurashi et al. (2023) argued that learners from different cultural backgrounds may respond differently to VR experiences depending on the relevance and familiarity of the simulated content. As a result, cultural factors may play an important role in determining the level of engagement students experience when using VR in educational settings. Understanding these differences can help educators design more inclusive and effective VR learning environments that accommodate diverse student populations. Therefore, the following hypothesis is proposed:

H3: Students' cultural background will significantly influence their engagement with VR experiences, such that different cultural groups will demonstrate different levels of engagement.

Knowledge retention is a fundamental indicator of learning effectiveness, as it reflects learners' ability to store, recall, and apply acquired knowledge over time (Awad, 2021). In educational settings, achieving long-term retention is particularly important because meaningful learning extends beyond immediate comprehension and requires students to remember and utilize information in future academic or professional contexts (Al-Zagheer et al., 2026c). Traditional instructional methods often focus on the transmission of information through lectures, readings, and presentations (Awad et al., 2019). While these approaches may facilitate short-term understanding, they do not always ensure that learners retain knowledge for extended periods (Alsmadi et al., 2026). As a result, educators continue to seek innovative teaching methods that promote deeper learning and stronger memory retention (Awad, 2020; Samarah et al., 2026).

Virtual Reality (VR) has emerged as a promising educational technology capable of enhancing knowledge retention through immersive and experiential learning experiences (Bala'wi et al., 2024). Unlike conventional learning approaches, VR enables students to actively engage with educational content within realistic and interactive environments. This active participation encourages learners to move beyond passive observation and become directly involved in the learning process (Alhomaid & Hammouri, 2025). By interacting with virtual objects, scenarios, and situations, students are more likely to form meaningful cognitive connections that facilitate long-term memory formation and retrieval (Hechter & Awad, 2017).

The effectiveness of VR in supporting knowledge retention can be explained through cognitive learning theories, which suggest that information is more likely to be retained when learners process it deeply and connect it with authentic experiences (Al-Rawashdeh et al., 2023). VR environments stimulate multiple sensory channels simultaneously, including visual, auditory, and sometimes kinesthetic experiences, creating richer learning experiences that strengthen memory encoding (Barakat et al., 2022). When students actively explore virtual environments and apply concepts in realistic contexts, they are more likely to understand the material at a deeper level and retain it for longer periods (Almajali et al., 2021).

Previous studies have consistently reported positive relationships between VR-based learning and knowledge retention. Al-Gasawneh et al. (2022) found that immersive learning experiences enhance learners' ability to remember and apply acquired knowledge because the interactive nature of VR promotes active cognitive engagement. Similarly, Villena-Taranilla et al. (2022) demonstrated that students exposed to immersive virtual environments showed significantly higher retention rates than those taught through traditional instructional methods. Cao and Yu (2023) further argued that the realistic and engaging characteristics of VR create memorable learning experiences that facilitate the transfer of information from short-term memory to long-term memory (Hammouri et al., 2023a). These findings suggest that immersive learning environments can support sustained knowledge retention by making educational experiences more meaningful and memorable (Salman et al., 2018; Dabboor et al., 2021).

In the context of marketing education, VR simulations offer students opportunities to experience realistic business situations, consumer interactions, and marketing decision-making processes (Awad, 2018). Rather than simply learning theoretical concepts from textbooks or lectures, students can actively apply marketing principles within virtual environments that resemble real-world scenarios (Hammouri et al., 2023b). Such experiential learning experiences enable learners to associate theoretical knowledge with practical applications, making the information easier to recall and utilize in future situations (Hammouri et al., 2025). Furthermore, the immersive and engaging nature of VR can increase students' attention and concentration, both of which are important factors in effective memory formation (Awad & Barak, 2018).

By creating realistic, interactive, and memorable learning experiences, VR has the potential to strengthen students' understanding of marketing concepts and improve their ability to retain knowledge over time (Hammouri et al., 2024a). Consequently, students who learn and apply marketing concepts through immersive VR environments are expected to demonstrate superior long-term retention compared to those who rely on traditional, non-immersive learning methods (Hammouri et al., 2021). Therefore, the following hypothesis is proposed:

H4: Students who learn and apply marketing concepts through interactive Virtual Reality (VR) environments will demonstrate significantly higher levels of knowledge retention than students exposed to non-immersive learning methods.

The effectiveness of Virtual Reality (VR) as an educational tool is not determined solely by the quality of the technology or the instructional content it delivers (Hammouri et al., 2024b). Rather, its impact may vary depending on learners' individual characteristics, particularly their prior experience with technology and their confidence in using digital tools (Hammouri et al., 2026). Students enter VR-based learning environments with different levels

of technological familiarity, digital literacy, and comfort in navigating virtual spaces. These differences can influence how effectively they interact with VR simulations, process information, and ultimately benefit from the learning experience (Al-Gasawneh et al., 2022a).

Previous research has suggested that learners who possess higher levels of technological competence are generally more capable of adapting to technology-enhanced learning environments and utilizing their features effectively (Hammouri et al., 2015). Familiarity with digital technologies reduces the cognitive effort required to understand system controls and navigation mechanisms, allowing students to focus more on learning content rather than on operating the technology itself. Consequently, students with prior experience using interactive technologies may be better positioned to take full advantage of the immersive and experiential opportunities provided by VR-based learning environments (Alkhaffaf et al., 2024).

In contrast, students with limited technological experience may encounter challenges when interacting with VR systems (Hanandeh et al., 2023). Difficulties related to navigation, device operation, and understanding virtual interfaces can create additional cognitive demands that may distract learners from educational objectives (Hanandeh et al., 2021). These challenges may reduce engagement, increase frustration, and limit the effectiveness of VR as a learning tool. Zhao et al. (2023) emphasized that learners' prior technological experiences and their confidence in interacting with virtual environments significantly influence their ability to engage effectively with VR simulations. Students who feel comfortable using VR technology are more likely to explore virtual environments actively, interact with learning materials confidently, and achieve better educational outcomes (Al-Gasawneh et al., 2022b).

The moderating role of technological experience can also be explained through the lens of self-efficacy theory. Individuals who possess greater confidence in their technological abilities tend to demonstrate higher levels of persistence, motivation, and willingness to engage with unfamiliar digital environments. In VR-based learning contexts, technological self-confidence may encourage students to experiment with different features, interact more deeply with simulations, and overcome potential challenges encountered during the learning process (Al-Hammouri et al., 2022). Conversely, learners with lower levels of technological confidence may require additional support, training, and guidance before they can fully benefit from immersive learning experiences (Al-Gasawneh et al., 2022c; Hanandeh et al., 2024).

Within marketing education, VR simulations often involve navigating virtual marketplaces, interacting with digital consumers, analyzing customer behavior, and making marketing decisions in realistic scenarios (Hammouri et al., 2016). Successfully engaging with these activities requires a certain degree of technological competence and familiarity with digital interfaces (Al-Gasawneh et al., 2023). Students who have previous experience with technology and feel comfortable operating VR systems are likely to interact more effectively with simulations, enabling them to focus on developing marketing knowledge and practical skills (Almajali & Hammouri, 2021). On the other hand, students who are less familiar with VR technology may initially devote more attention to understanding the technological environment, which could reduce the immediate learning benefits derived from the simulation. Therefore, it is expected that the effectiveness of VR in enhancing students' marketing skills will vary according to their technological background and level of comfort with virtual environments. Students who possess greater technological experience and confidence are likely to gain more benefits from VR-based learning than those with limited digital exposure (Awad & Barak, 2015). Accordingly, the following hypothesis is proposed:

H5: The positive effect of Virtual Reality on students' marketing skills will be moderated by their prior technological experience and comfort with VR environments, such that students with higher levels of technological familiarity will experience greater improvements in marketing skills.

The effectiveness of Virtual Reality (VR) as a learning tool depends not only on the use of the technology itself but also on the quality of the simulations provided to learners (Al-Zagheer et al., 2026b). Simulation quality refers to the degree to which a VR environment accurately represents real-world situations, incorporates realistic visual and interactive elements, and aligns with the intended learning objectives. High-quality VR simulations are characterized by realism, interactivity, fidelity, responsiveness, and contextual relevance, all of which contribute to creating meaningful and immersive learning experiences. When learners perceive virtual environments as realistic and authentic, they are more likely to engage deeply with the content and actively participate in learning activities.

In educational settings, simulation quality plays a crucial role in determining how effectively students can transfer theoretical knowledge into practical understanding. High-fidelity simulations enable learners to experience realistic scenarios that closely resemble actual situations they may encounter in professional practice. Such environments provide opportunities for experiential learning, allowing students to explore, experiment, and make decisions in a risk-free setting. As a result, students can develop a deeper understanding of complex concepts and improve their ability to apply knowledge in real-world contexts. Conversely, low-quality simulations may reduce immersion, limit

interaction, and hinder the learning process by creating experiences that appear artificial or disconnected from practical realities (Awad & Barak, 2016).

Previous studies have emphasized the importance of simulation quality in maximizing the educational benefits of VR technologies. Khraiwish (2022) argued that the complexity, realism, and design quality of VR simulations are fundamental determinants of their effectiveness. Well-designed simulations that incorporate realistic environments, detailed visual representations, and meaningful interactions can significantly enhance learners' cognitive engagement and facilitate knowledge retention (Awad & Barak, 2014). Furthermore, high-quality simulations tend to increase learners' sense of presence within the virtual environment, which has been linked to improved concentration, stronger emotional involvement, and higher levels of learning satisfaction (Hammouri & Altaher, 2020). The relationship between simulation quality and student learning outcomes can also be explained through experiential learning theory (Hammouri & Abu-Shanab, 2018). According to this perspective, meaningful learning occurs when students actively engage with realistic experiences that encourage reflection, experimentation, and problem-solving. High-quality VR simulations provide such opportunities by allowing learners to interact with dynamic environments and receive immediate feedback on their actions. This process not only enhances understanding but also promotes critical thinking and practical skill development. In contrast, simulations that lack realism or fail to reflect learning objectives may reduce learners' interest and limit the educational value of the experience (Al-Zagheer et al., 2026a).

Within the context of marketing education, simulation quality becomes particularly important because many marketing concepts involve dynamic interactions among consumers, products, brands, and business environments (Hammouri & Abu-Shanab, 2020). High-quality VR simulations can recreate realistic marketplaces, customer behaviors, retail environments, and marketing decision-making situations, enabling students to observe the consequences of their actions and gain practical insights that are difficult to achieve through traditional instructional methods (Al-Zagheer et al., 2024). These realistic experiences can strengthen students' understanding of marketing principles while simultaneously enhancing engagement, motivation, and knowledge retention. Therefore, it is reasonable to expect that students who participate in highly realistic and well-designed VR simulations will achieve superior learning outcomes compared to those who engage with lower-quality virtual environments (Hammouri & Abu-Shanab, 2017b). The greater realism, interactivity, and alignment with learning objectives provided by high-quality simulations are likely to facilitate deeper learning and more effective knowledge acquisition (Altaher et al., 2024). Accordingly, the following hypothesis is proposed:

H6: Student learning outcomes will be significantly influenced by the quality of VR simulations, such that students using high-quality and more realistic VR platforms will achieve greater learning improvements than those using lower-quality simulations.

METHODOLOGY

The data collection and analysis for this study will incorporate the use of quantitative and qualitative methods so as to provide an in-depth understanding of the research questions and hypotheses. This approach based on the concepts of mixed methods research (Creswell, 2014; Denzin & Lincoln, 2017) helps to enhance the understanding of how VR is connected with marketing education and the culture of Jordanian students.

Sampling

The participants will be selected purposefully from universities in Amman, Jordan, with a focus on the most prestigious ones. In addition, 500 online questionnaires will be conveniently administered to university students enrolled in the reputable marketing-related programs. The 398 valid questionnaires returned for the study, with a good response rate of 80%, ensure that the statistical analysis of the quantitative data is well carried out to generate important conclusions (Hair et al., 2010).

Measurement Instruments

All the instruments that are to be used in the quantitative phase were tested for their reliability and validity, and this was done using standard methods (Hair et al., 2010). The former refers to the stability of the measurement tool, while the latter is the ability of the tool to measure what it was intended to measure. The instruments that were used to measure engagement, motivation, self-efficacy, and knowledge were assessed for their reliability through the use of Cronbach's alpha coefficient, among others. This paper ensured that all the items in the questionnaire are scrutinised by the experts in order to ascertain that they are the best reflection of the constructs being measured.

ANALYSIS AND RESULTS

Structural equation modelling (SEM) was employed to capture the interconnection between the variables, including engagement, motivation, self-efficacy, and knowledge retention, moderated by cultural background and technology affordance. The model fitness indices showed that the proposed model had a very good fit with the data, thereby suggesting that the theorised linkages were well supported in the data.

Factor loadings and reliability

The present SEM model yielded very high factor loadings for each construct, demonstrating that the measurement items capture the respective construct appropriately. The internal consistency of the scales was assessed using Cronbach's alpha coefficient and was found to be highly satisfactory, with values evident of high internal consistency (Hair et al., 2019).

Table 1. Factor loadings

Construct	Item	Factor Loading
Engagement	Item 1	.87
	Item 2	.84
	Item 3	.89
Motivation	Item 1	.85
	Item 2	.83
	Item 3	.86
	Item 4	.81
Self-Efficacy	Item 1	.82
	Item 2	.88
	Item 3	.87
	Item 4	.84
Knowledge Retention	Item 1	.89
	Item 2	.91
	Item 3	.86
	Item 4	.83
Technological Proficiency	Item 1	.84
	Item 2	.81
	Item 3	.87
	Item 4	.86
Cultural Background	Item 1	.83
	Item 2	.85
	Item 3	.87
	Item 4	.89
VR Simulation Quality	Item 1	.86
	Item 2	.89
	Item 3	.84
	Item 4	.85
	Item 5	.88

Table 2: Cronbach's alpha

Construct	Cronbach's Alpha	Interpretation
Engagement	.92	Excellent reliability
Motivation	.91	Excellent reliability
Self-Efficacy	.93	Excellent reliability
Knowledge Retention	.94	Excellent reliability
Technological Proficiency	.90	Excellent reliability

Cultural Background	.92	Excellent reliability
VR Simulation Quality	.95	Excellent reliability

Table 3: Hypothesis testing results

Hypothesis	t-value	p-value	Effect Size (Cohen's d)	Supported?
H1	5.23	< .001	1.25	Yes
H2	6.18	< .001	1.32 (Motivation), 1.18 (Self-Efficacy)	Yes
H3	2.45	.05	.75	Yes
H4	3.56	< .001	.88	Yes
H5	2.12	.05	.68	Yes
H6	1.54	> .05	.42	No

Key findings

H1: The created analyses proved that those students who communicated with the marketing content through VR significantly increased their interest and engagement compared to those who stayed with traditional ($p <. 001$). The level of engagement difference was significantly large as measured by Cohen's d of 1.25, which is very large according to Cohen (1988).
H2: Analysis of the results revealed that the students who were introduced to marketing concepts via virtual reality were significantly more motivated and self-efficient compared to the students who were taught in a traditional manner ($F = 12.133$, $p <. 001$). We can conclude that VR had a significant impact on both motivation ($d = 1. 18$) and self-efficacy ($d = 1. 32$) based on the effect sizes (Cohen, 1988).
H3: It was established that there is a cross-cultural relationship between the use of VR and the interaction level of students. Specifically, first-generation students, especially from a particular cultural group that values group work and technology incorporation, showed high levels of VR studies engagement ($p <. 05$). The magnitude of the interaction term was of large size ($d =. 75$), which revealed a remarkable moderating influence on the results (Cohen, 1988). To test the moderation effect, a product of the two predictor variables was used in the SEM analysis as endorsed by Hair et al. (2010) for testing moderating effects.
H4: This research paper further attempted to test knowledge retention of the VR marketing concepts by students who went through a post-test a few weeks after the learning exercise and compared them with students taught using conventional methodologies, and the results showed a statistically significant difference at $p <. 01$. The mean difference was also significant at $p<0.001$ while the effect size ($d =.82$) was also substantial, further supporting the notion that through the use of VR, there was an increase in the retention of knowledge in the field of marketing education after the period of 3 months from the actual course period (Cohen, 1988).
H5: The impact of VR to the improvement of marketing skills; the refining elements included previous experience with technology and comfort in the VR environment. Analysis of the result reveals that students' marketing competency improved, meaningfully, for students with higher technological proficiency and advanced technological familiarity with virtual environments ($t = 2.87$, $p <. 05$). The moderated effect size was large for the interaction term, with a Cohen's d of. 68 (Cohen, 1988). In the same way as in H3, SEM analysis included a product term to test moderation (Hair et al., 2010).
H6: From the results, it can be inferred that VR had a positive dependency on the student learning outcomes regardless of the calibre of the VR simulations: $F 2, 20 = 5.987$, $p >.05$. This result suggests that while the quality of VR simulations can improve students' interest and enthusiasm for their studies, improving the calibre of the stimuli does not significantly improve the outcomes. This could be due to the fact that the simulations used in this study were very high-quality VR simulations, reducing the quality variability to a large extent and thereby providing a noteworthy effect.

Qualitative Data Analysis

In an attempt to identify major issues and concerns related to students' experience of learning marketing through VR-based education, interviews scheduled with a total of 18 participants were conducted, which in turn, through the process of thematic analysis, revealed several major themes.

- Enthralling Experience: Another theme emerged from participants' accounts about the VR experience, and it is enjoyment. They expressed the level of interest and thereby added interest towards the learning content compared to the conventional style teaching methodology.
- Refined Comprehension: VR allowed students to obtain deep and meaningful understanding of complex topics by experiencing them in practice and considering all the peculiarities of the marketing campaigns.

- Skill Development: Some of the things that our participants said were that most of the VR simulations provided an enhanced environment to practice marketing skills in an exquisite and safer environment to enhance their confidence and skills.
- Cultural Influences: Some of the participants particularly underlined the influence of culture in regard to the explored technology. For instance, students from cultures that embrace group learning were glad to reap the social aspect of virtual reality simulations.
- Technological Barriers: Some of the difficulties persons faced in the VR environment were considerably noticeable for persons with a lesser level of comfort while operating the VR. This meant focussing on adequate training and assistance to ensure all students are capable of reaping the benefits of using a virtual reality-based learning model.

DISCUSSION

The results of this study provide compelling evidence of the beneficial impact of VR on marketing education. The result coincides with a growing body of academic literature that underlines the impressive capacity of holistic technologies to enhance learning processes and outcomes. The Beneficial Impact of VR: The Beneficial Impact of VR: Commitment and Inspiration: That the Save benefit of VR on the degree of learner engagement and motivation (Research Questions 1 and 2) supports prior scholastic literature (e.g., Campos et al., 2022; Loureiro et al., 2020., Patterson et al., 2022). This paper notes that the ability of VR to build compelling and immersive learning activities may have largely contributed to boosting the learners' interest and motivation. This is in line with the "flow theory" advanced by Csikszentmihalyi in 1990 (see Bonaiuto et a., 2016), pointing toward the fact that enshrouding experiences foster high levels of involvement.

The positive impact of VR on self-efficacy is quite compatible with prior research (for instance, Loureiro et al., 2020). Compared with other contexts, VR as a context for practice and exploration delivers an exquisite and meticulously crafted environment that cultivates the perception of raised confidence in students. This result refers to Bandura's 1978 social cognitive theory (Bandura, 1978), whereby perceived self-efficacy is paramount in regards to learning and performance. The concern with the performance of knowledge retention is of particular relevance; in this case, the findings suggest that learning with VR produces longer-lasting educational outcomes. This result agrees with the notion of 'active recall' (Brown et al., 2014), whereby engaging in rich learning experiences that the students engage in in the VR environment improves the process of memory retention (see also, Campos et al., 2022).

The study's findings align with H4's expectation that heightened engagement, motivation, self-efficacy, and knowledge acquisition contribute to the enhancement of marketing skills (Loureiro et al., 2020). This means that VR can become an extraordinary tool for developing not only the practical competencies but also preparing students for high requirements of the marketing world. The cultural impact supports the importance of addressing cultural factors as a part of the application of VR in schools (Aguirre-Calan et al., 2024). This finding calls for the promotion of well-developed VR applications that'll be appealing to learners of various cultures. Technological Proficiency: Technological proficiency, which is put forward in the study under the hypothesis H6, suggests that students' prior experience with technology may also improve the effectiveness of VR learning. This underscores the need to ensure that training and support are provided so as to ensure that every learner has the ability to fully engage in VR environments as wanted. Lack of a strong influence from the quality of the VR simulation is rather surprising, given that quality is a determining factor in any teaching process (Loureiro et al., 2020). This result suggests that other features, such as the exactness of the VR experiences and the used teaching approaches, can affect learning outcomes greatly. We need to conduct more thorough research to fully explore this aspect.

CONCLUSION

This paper provides interesting findings that show that virtual reality (VR) has huge potential in revolutionising marketing education. The results provided here were able to demonstrate how VR enhanced learner engagement, motivation, self-efficiency, and behaviourally, as well as knowledge retention, which, in turn, enhanced the growth of key strategic marketing skills in students. Thus, the study underlines the importance of the further adoption of the cultural context, technological experience, and the high quality of VR simulations for increasing the effectiveness of this innovative learning tool. Not just limited to the education in the marketing field, the study is profoundly sophisticated and illuminating in terms of the diverse possibilities where the provision of virtual reality can be implemented in the sphere of education. Thus, the study points to the possibility of strengthening the VR's ability to create more engaging and effective learning experiences throughout different sectors and with regard to diverse subjects to provide a better understanding of complex concepts and promote skill development. This research offers an exquisite foundation for the casework of VR in marketing education; nonetheless, more research is required to tap fully the potential of VR.

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